Figure 1

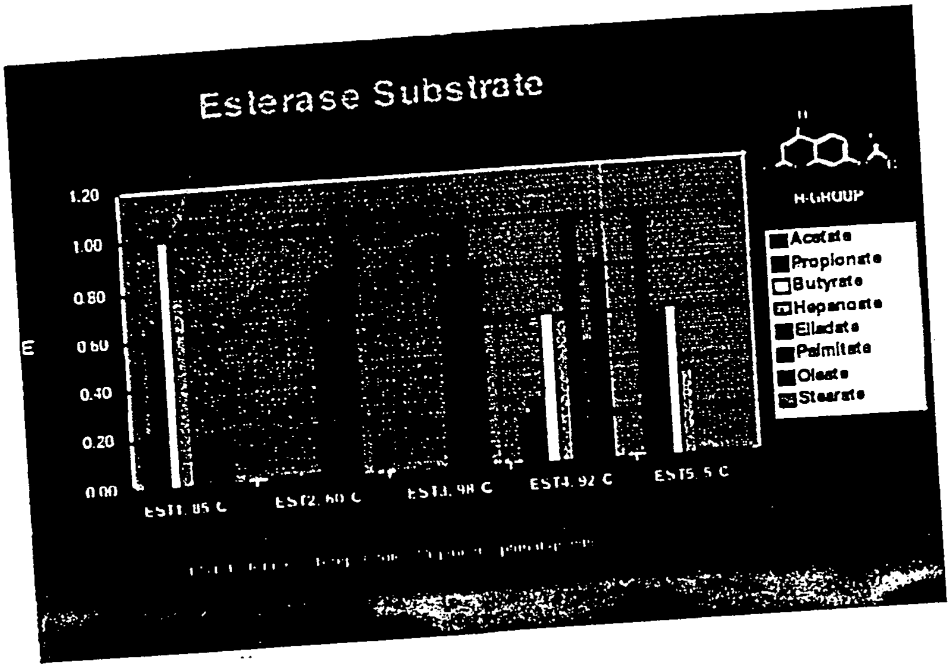
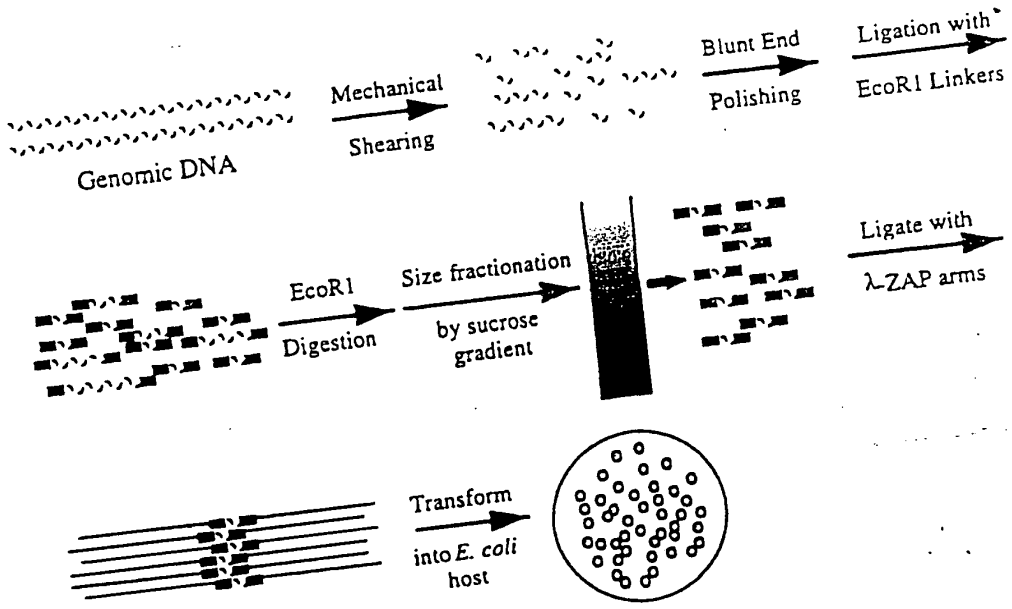

Esterase Substrate
R-GROUP
1.20
1.00
0.80
0.60
0.40
0.20
0.00
Acetate
Propionate
Butyrate
Hepanoate
Palmitate
Oleate
Stearate

Figure 2.


Genomic DNA
Mechanical
Shearing
Blunt End
Polishing
Ligation with
EcoR1 Linkers
EcoR1
Digestion
Size fractionation
by sucrose
gradient
Ligate with
λ-ZAP arms
Transform
into E. coli
host

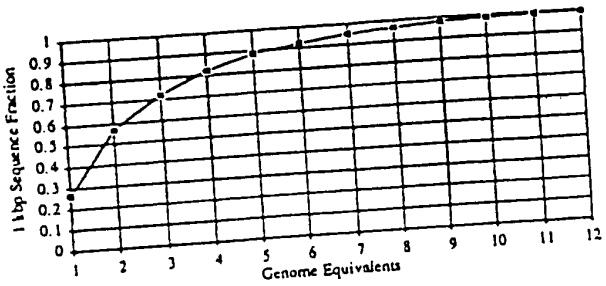

1 kbp Sequence Fraction
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1
2
3
4
5
6
7
8
9
10
11
12
Genome Equivalents

Figure 3.

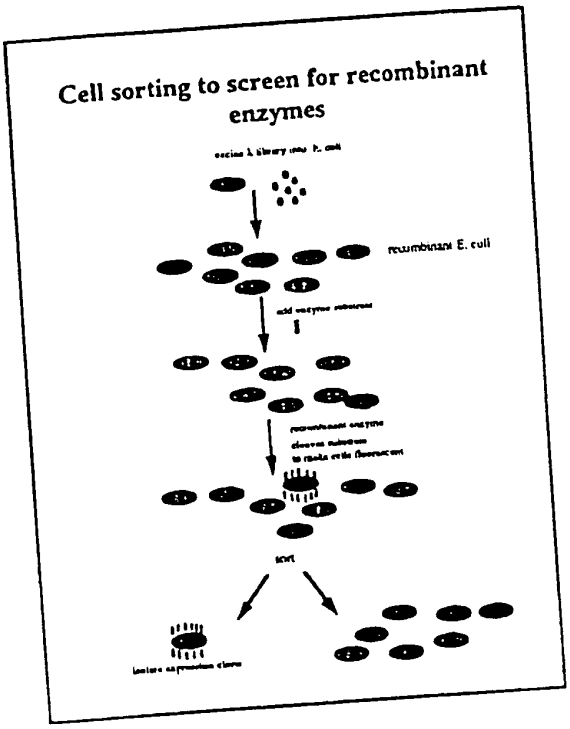
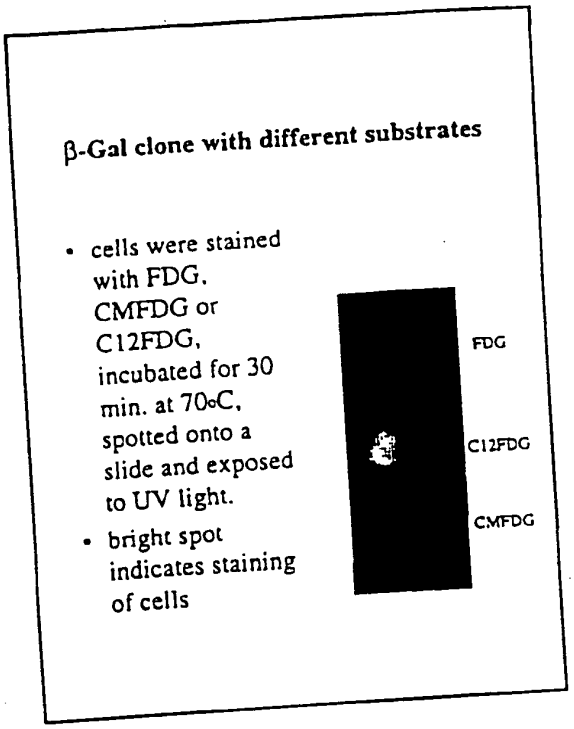

Cell sorting to screen for recombinant enzymes
recombinant E. coli
sort

Figure 4.



E. coli expressing β -Gal from Sulfulobus spec. was grown over night. Cells were centrifuged and substrate was loaded with deionised water. After 5 min. cells were centrifuged and transferred into HEPES buffer and heated to 70∘C for 30 min.. Cells were spotted onto a slide and exposed to UV light.

Figure 5

Figure 6

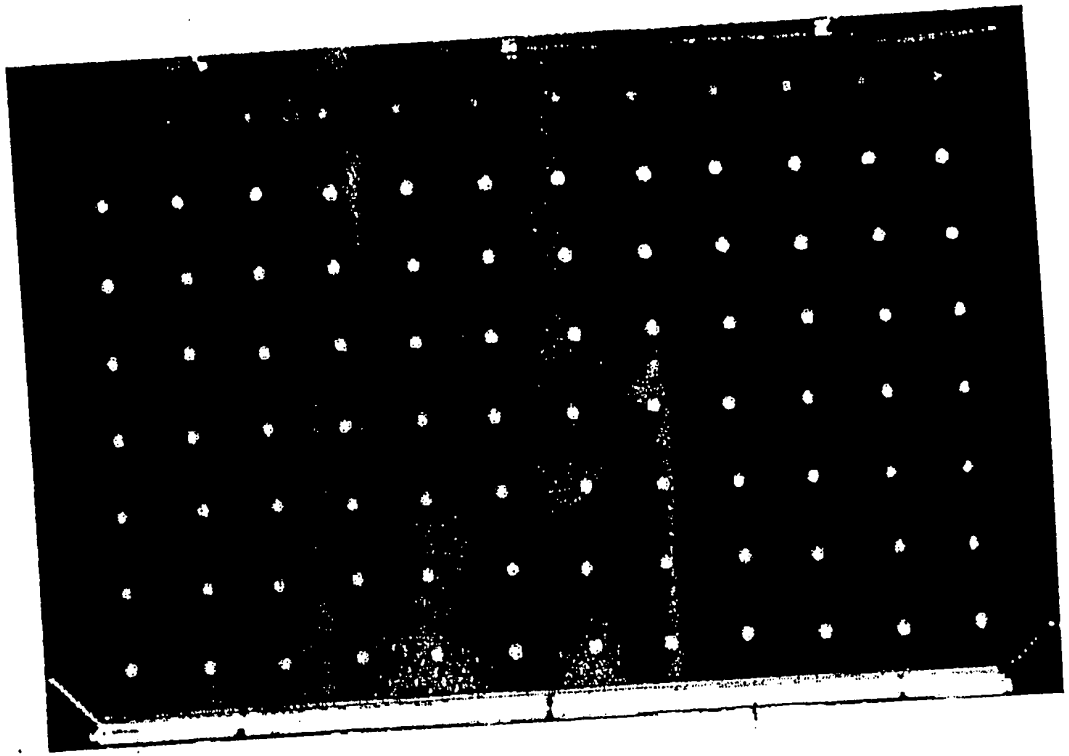
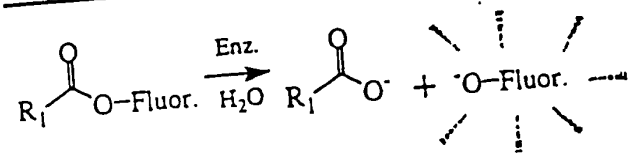


Figure 7

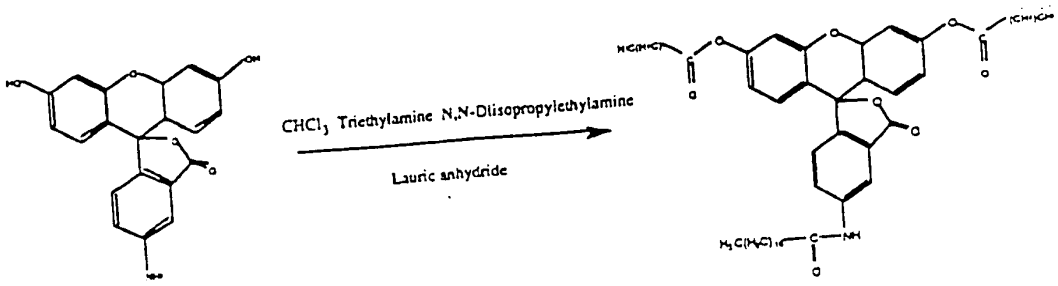


Principle type of fluorescence enzyme assay of deacylation.

Figure 8

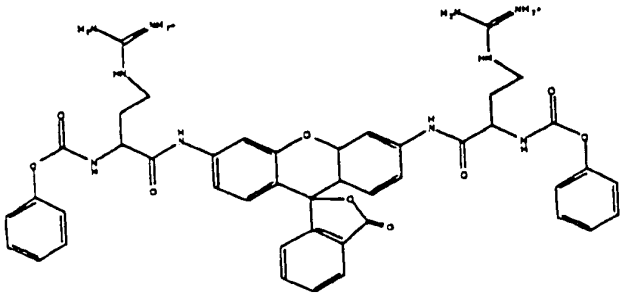
Staining of β-galactosidase clones from the hyperthermophilic archaeon *Sulfolobus solfataricus* expressed in *E.coli* using C_{12}-FDG as enzyme substrate.

Figure 9



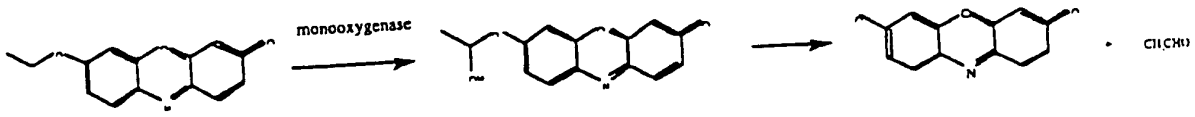
Synthesis of 5-dodecanoyl-aminofluorescein-di-dodecanoic acid

Figure 10



Rhodamine protease substrate.

Figure 11



Compound and process that can be used in the detection of monoxygenases

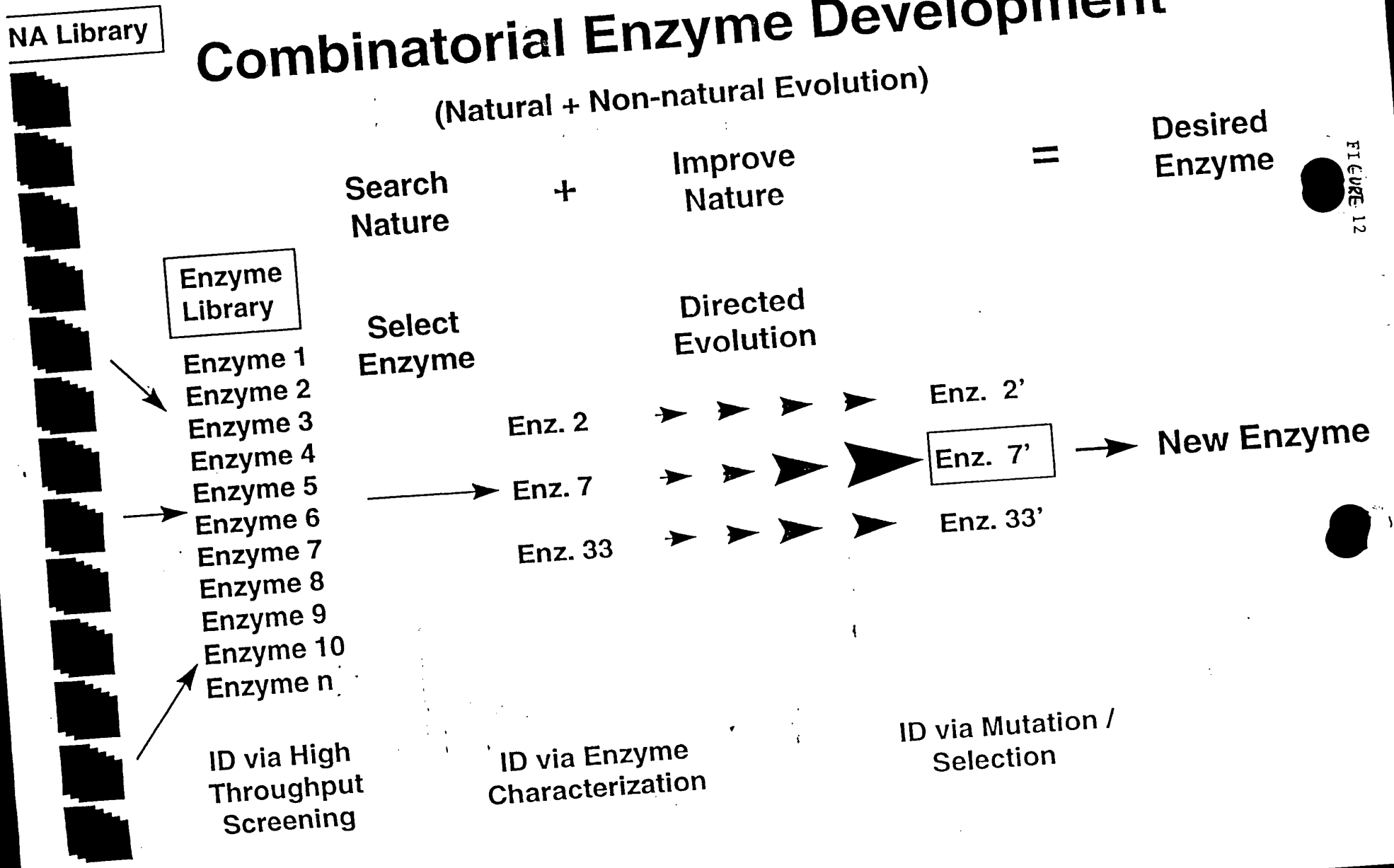


FIGURE 12

Bypassing Barriers to Directed Protein Evolution

(Barrier = Capacity limit of directed evolution system)

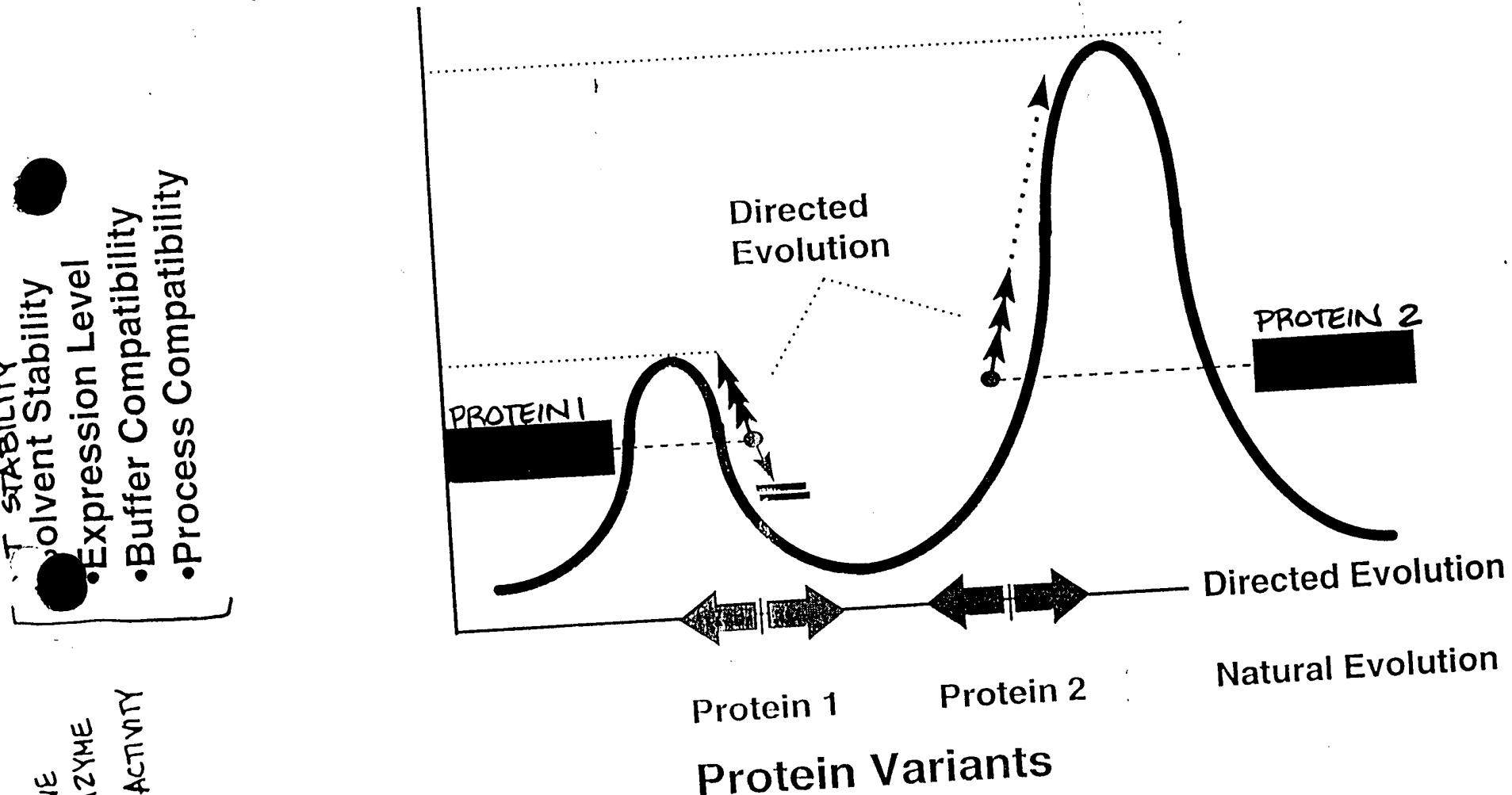
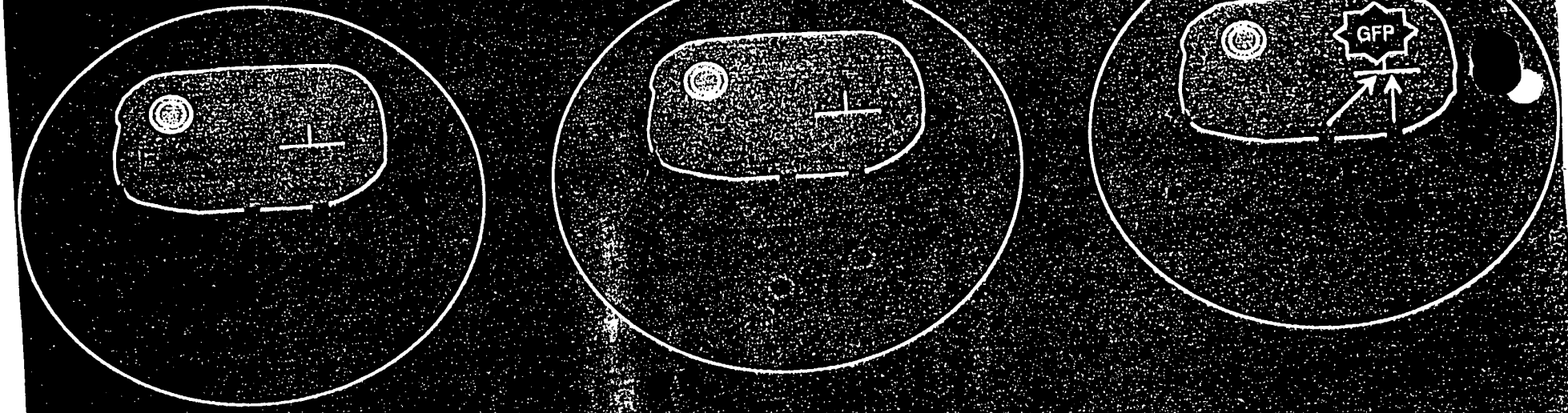


FIGURE 13

Co-Encapsulation Assay for Novel Bioactive Discovery



Co-encapsulation
Library + Eukaryote

Growth and expression
of small molecule from host

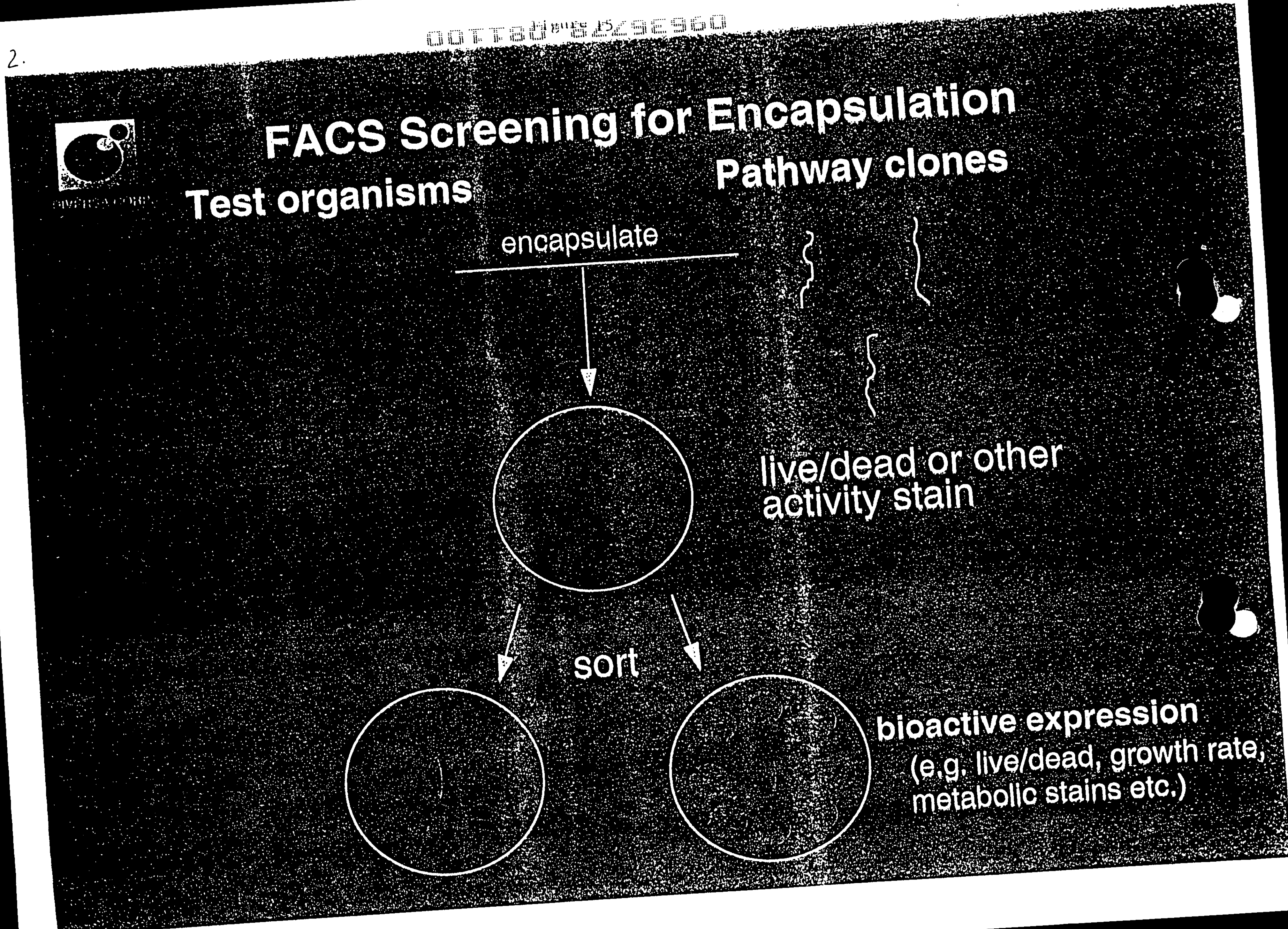
Receptor binding of small
molecule & GFP reportir

E= Eukaryotic assay organism
GFP = Green Fluorescent Protein

L = Large insert library
R = Eukaryotic receptor

SM = Small molecule

2.

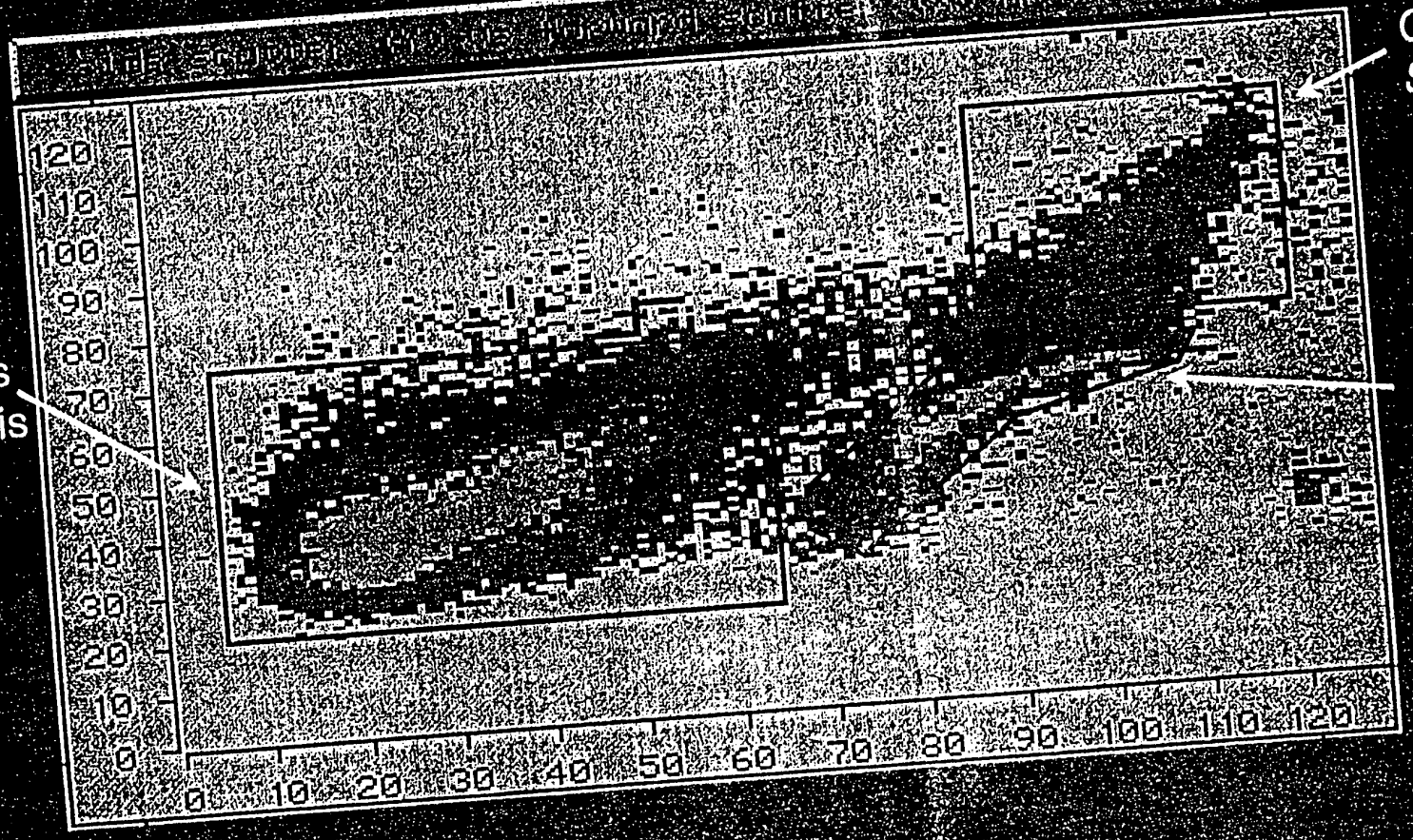

FACS Screening for Encapsulation
Test organisms
Pathway clones
encapsulate
live/dead or other activity stain
sort
bioactive expression
(e.g. live/dead, growth rate, metabolic stains etc.)

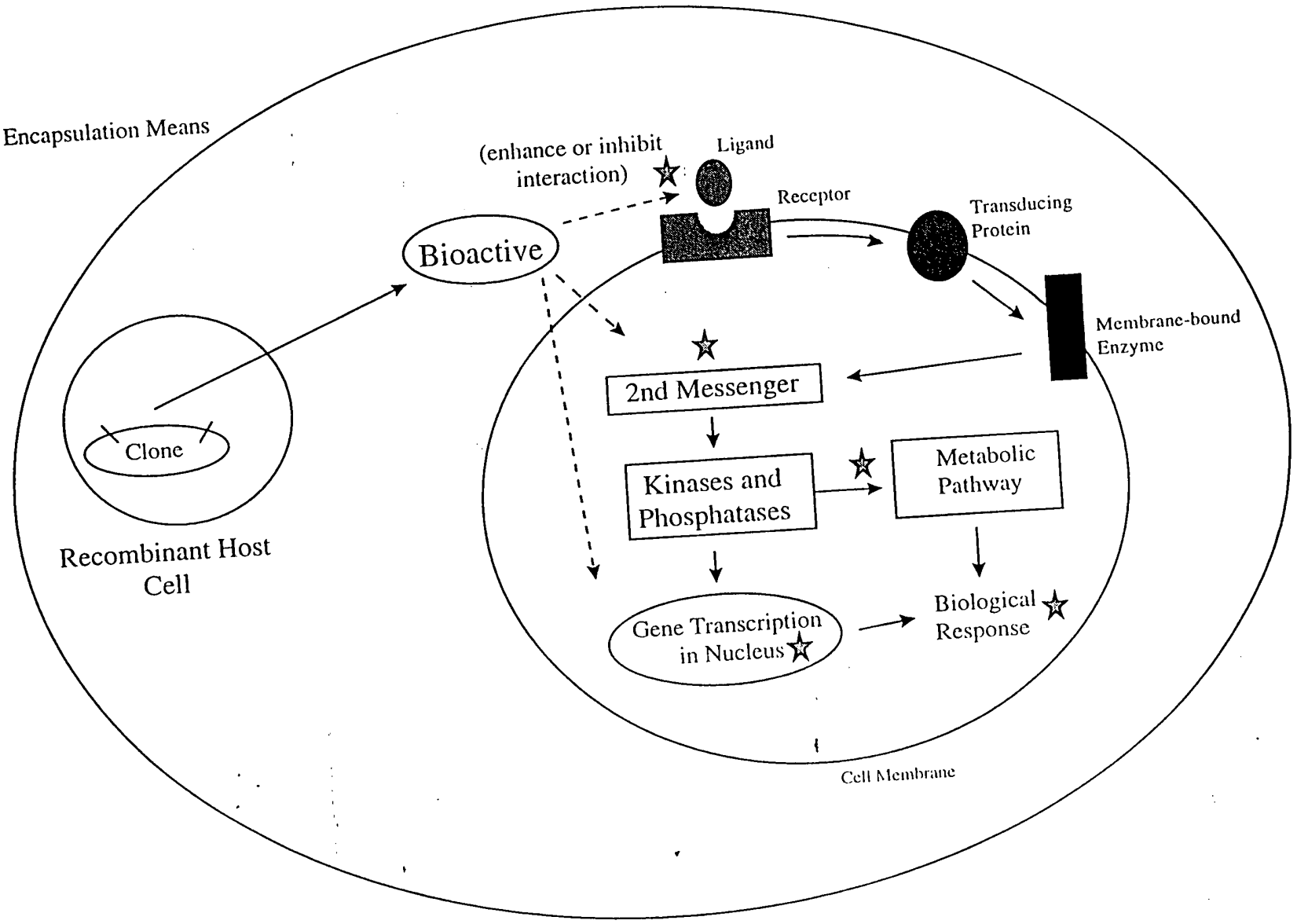
Development of Unicellular *Streptomyces* Strains for Ultra-High Throughput Screening

Streptomyces lividans mycelia

Streptomyces "diversa" unicells

FACS Enrichment for Gel Microdroplets Containing *S. diversa*




Encapsulation Means
(enhance or inhibit interaction)
Ligand
Receptor
Transducing Protein
Bioactive
Membrane-bound Enzyme
2nd Messenger
Clone
Kinases and Phosphatases
Metabolic Pathway
Recombinant Host Cell
Gene Transcription in Nucleus
Biological Response
Cell Membrane